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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ROSASCO, STEPHEN D	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/622,995	TEJNIL, EDITA	
	Examiner	Art Unit	
	Stephen Rosasco	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/18/03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/18/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Reich et al. (5,900,340).

The claimed invention is directed to a method comprising: providing design data and design rules for a layout;

converting said design data into primary features for a set of mask patterns; generating assist features for said primary features checking whether said design rules are violated;

repeating said converting and said generating until said design rules are no longer violated;

verifying whether said mask patterns can be combined to produce said layout;

adjusting said primary features and said assist features until said layout is produced; and

obtaining final mask data for said layout.

Reich et al. teach a method for adding subresolution assist features to a semiconductor design to correct for proximity effects in the semiconductor design comprising the steps of:

A) performing a growing function on a base shape by a first amount to produce a first shape;

B) performing the growing function on the base shape by a second amount to produce a second shape;

C) subtracting the second shape from the first shape to produce the subresolution assist features; and

D) unioning the base shape and the subresolution assist features to form a final shape, wherein the final shape including the subresolution assist features formed adjacent to the base shape.

Reich et al. further teaches the method comprising:

E) generating an altered semiconductor design file containing the final shape;

F) creating a set of one or more lithographic masks from the altered semiconductor design file; and

G) fabricating a plurality of integrated circuits from the set of one or more lithographic masks.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 16-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Mansfield et al. (6,421,820) or Chang et al. (6,370,679).

Mansfield et al. teach (see claim 39) a method of modifying the design of a photomask, the design of the photomask including a plurality of shapes, each shape being adjacent to at least one neighboring shape, the method comprising: (a) measuring a distance between a shape and a neighboring shape; (b) determining a normalized space count by dividing the measured distance by a normalized space constant and taking an integer value; (c)

determining a correct number of assist features by subtracting one from the normalized space count; (d) determining a normalized space by dividing the measured distance by the normalized space count; (e) adding a number of assist features to the design of the photomask in a space substantially between the shape and the neighboring shape, wherein the assist features each have a size and placement that are determined based on the normalized space. (f) repeating steps (a) through (e) for each of the plurality of shapes in the design; (g) measuring a distance between a designed shape and a neighboring shape or assist feature; (h) generating a modified shape by moving edges of the designed shape based on measurement performed in step (g); (i) repeating steps (f) through (h) for each of the plurality of shapes in the design.

Chang et al. teach a method of generating proximity corrections for an integrated circuit layout, wherein the data describing the integrated circuit layout comprises a hierarchical structure including a plurality of layout cells, the method comprising: providing the integrated circuit layout design as a first input;

providing a particular set of correction criteria as a second input;

analyzing the integrated circuit layout to identify features of the layout that meet the particular set of correction criteria;

generating proximity correction data in response to the particular set of correction criteria for the features that meet the particular set of correction criteria;

and providing a first program data wherein the first program data comprises the proximity correction data configured in a hierarchical structure that substantially preserves the plurality of layout cells in the hierarchical structure of the integrated circuit layout, wherein providing the first program data comprises: generating a plurality of delta planes corresponding to the plurality of cells wherein each delta plane comprises data representative of the difference between a

correction plane of the cell corresponding to the delta plane and the delta planes corresponding to the children cells of the cell corresponding to the delta plane.

And wherein the proximity correction data comprises data corresponding to the addition of serifs to the layout.

Chang et al. also teach that the several known OPC software implemented products available that adjust mask definitions to include OPC features. have a number of limitations in terms of correctness, speed, data volume, and verification of the resultant OPC corrected mask design. For, the current products do not maintain the true hierarchical data format of the original mask design when the OPC features are added to the mask design. These products must first expand the original mask design to some type of a flattened data format prior to compensating by adding correction features. This causes the size of the resultant corrected design data file to increase several fold, and thus slow down the process of OPC. Further, and more importantly, because they do not maintain the original true hierarchical data format of the mask design, it is extremely difficult and time consuming to verify currently known OPC corrected masks using conventional verification tools which require the same hierarchical data format as the original mask.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Rosasco whose telephone number is 571-272-1389. The examiner can normally be reached on M-F from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff, can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

For general Information call (571-272-1700).

S. Rosasco
Primary Examiner
Art Unit 1756

S.Rosasco
2/19/04